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## MOUNTED SKELETONS OF *EOHIPPUS*, *MERYCHIPPUS* AND *HESPEROSIREN*


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Three mounts of fossil mammals recently completed in this Museum are of considerable interest and have not previously been figured. The accompanying photographs of *Merychippus* and *Hesperosiren* are by Albert Thomson and that of *Eohippus* by Irving Dutcher.

### **Eohippus venticolus** (Cope)

Amer. Mus. No. 4832 is the classic "*Hyracotherium*" skeleton of Cope, that on which ideas of this earliest stage of horse evolution were originally and principally based. It was collected in the type Wind River of Wyoming by Wortman in 1880, and has frequently been figured.[1] As illustrated by Cope, it lay on its right side in the matrix. After its acquisition by the American Museum, it was mounted under the direction of the late W. D. Matthew as a slab mount, with pose and restored parts almost identical with Cope's figure. This had the disadvantages of being very stiff and unnatural (unavoidable in a matrix mount but seldom admissible in a slab or free mount), of having many restored parts definitely incorrect (as shown by later discoveries), of exposing that side of the skeleton which is much less complete, and of facing the wrong way for inclusion in our horse evolution series as now being rearranged. These serious disadvantages seemed to outweigh the historical interest of retaining Cope's pose and restoration, and the specimen was disarticulated and remounted by Haakon Dehlin under my direction.

As now exhibited, the skeleton is a slab mount, facing to the right. Right fore and hind limbs are nearly perfect, while the left side, now farther from the observer, is poor, the left fore limb being fragmentary and the left hind limb wholly restoration. The head and anterior vertebræ were lowered and the curve of back and tail modified to make them more even and natural. Scapula and pelvis, both lacking as originals in

[1] E.g.: Cope, E.D. 1884. 'The Vertebrata of the Tertiary Formations of the West.' U. S. Geol. Surv. Ter. (Hayden), III. [See Pl. XLIX C, etc.]
Matthew, W. D. 1921. 'Evolution of the Horse.' Amer. Mus. Guide Leaflet, No. 36 (4th Ed.). [See Fig. 8.]

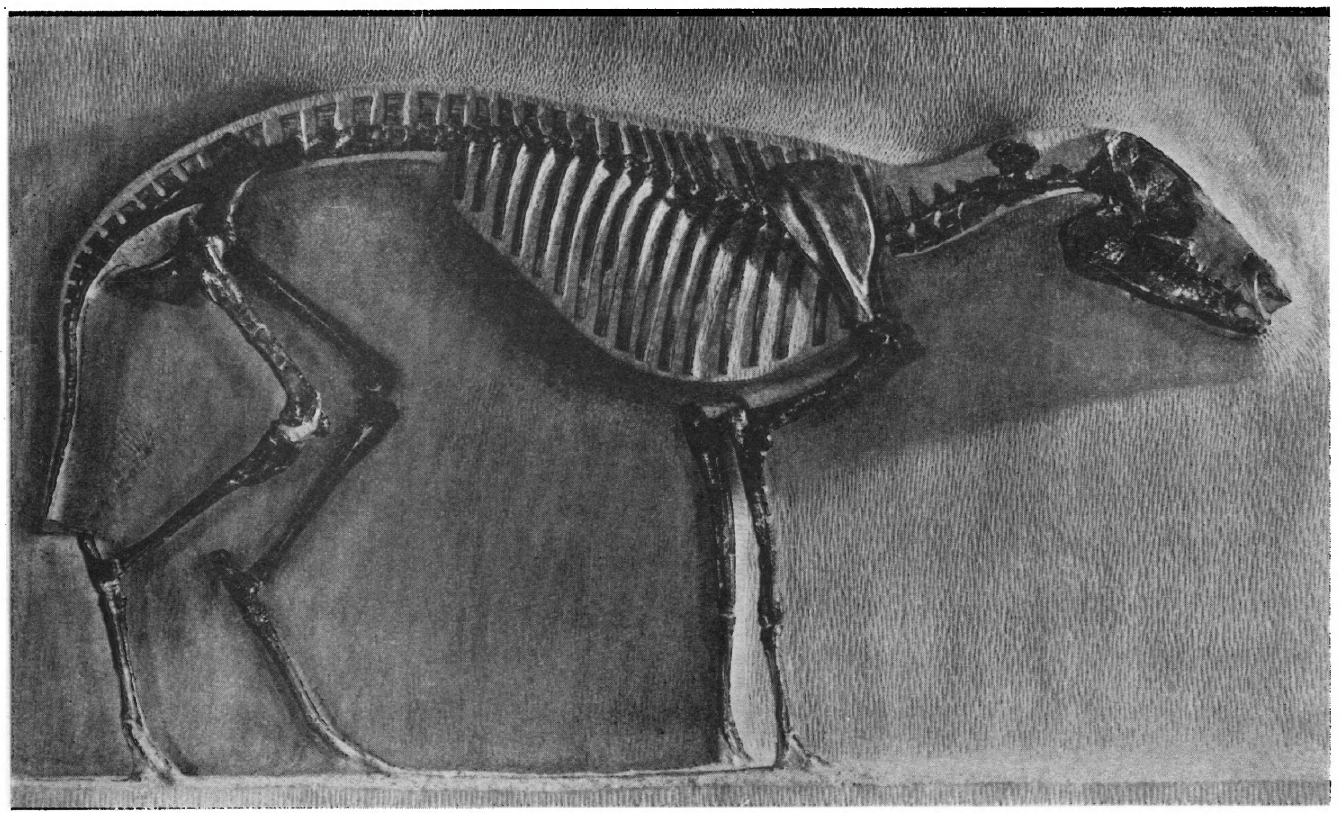

Fig. 1. *Eohippus venticolus* (Cope). Amer. Mus. No. 4832. Mounted skeleton, from the right side. Length of original skeleton, 68 cm.

this specimen, were replaced by much modified restorations based on newer material of *Eohippus*. The neural spines of the posterior cervicals and anterior dorsals were also modified. The scapula was shifted forward and upward, and the feet, formerly posed as extremely unguligrade, were made digitigrade.[1] The number of dorsal vertebræ was reduced from nineteen to eighteen, permitted by the specimen and apparently more probable as well as giving better proportions.

These and other minor changes are believed to reproduce the original structure and pose more nearly than did the old mount, and it is hoped that the present illustration will be used in future in place of the older ones.

As now mounted, the total length is 68 cm. (2 ft. 2¾ in.), the greatest height of the back (at the second lumbar) 37.5 cm., and the height at the fifth dorsal 34.5 mm.

**Merychippus isonesus quintus** Osborn

Although isolated teeth, jaws, and other parts of *Merychippus* are extremely abundant, mountable skeletons have so far been very rare. For many years such a skeleton has been desired by the Museum. In the revision of our series of skeletons illustrating the evolution of the horse, this stage seemed essential, and as there is no immediate prospect of obtaining a perfect skeleton, it was decided to mount the type of *Merychippus isonesus quintus* Osborn. The dentition and limbs have been partially described and figured by Osborn.[2]

The skeleton, Amer. Mus. No. 14185, was collected by W. D. Matthew in 1908 in the Sheep Creek Beds of Nebraska, Middle Miocene. It has been prepared and restored largely by Albert Thomson, also in part by Jeremiah Walsh and Otto Falkenbach, and mounted by Charles Lang. All the original bone in the mount belongs to a single individual, the missing parts being modeled or cast from other specimens of the genus. As every part is known in one or another of the close relatives of this species, the result is in no respect conjectural and must very closely approximate all the characters of this form.

Of the head of this individual, only left $I^{1-2}$ and $P^2$-$M^3$, right $P^2$-$M^3$, left $I_{1-2}$, and $P_{2-3}$, right $I_{1-2}$ and $P_{2-3}$, and part of the right maxilla were available. The skull was cast from Amer. Mus. No. 8347, *Merychippus republicanus*, and modified slightly to fit the teeth of this species.

[1]They might perhaps have been even more so, as suggested by Dr. Matthew, who saw tl is new mount on his last visit to the Museum.

[2]Osborn, H. F. 1928. 'Equidæ of the Oligocene, Miocene, and Pliocene of North America, Iconographic Type Revision.' Mem. Amer. Mus. Nat. Hist., N.S. II, Part I. [See pp. 107–108; text fig. 81; Pl. XIII, figs. 7, 7*a*; Pl. XIV, fig. I; Pl. XLI, fig. 4; Pl. XLV, figs. 2, 5; Pl. XLVI, fig. 4.]

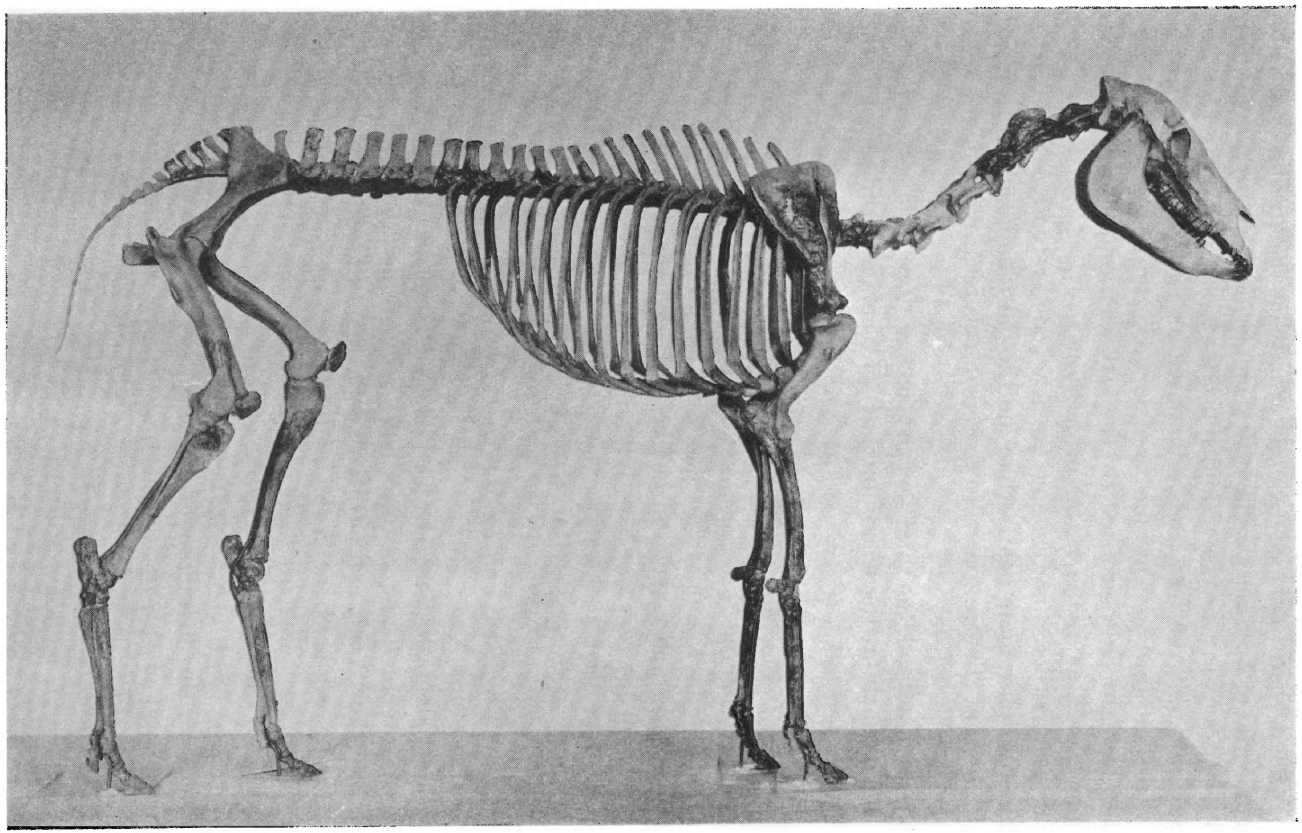

Fig. 2. *Merychippus isonesus quintus* Osborn. Amer. Mus. No. 14185. Mounted skeleton, from the right side. Length of original mount, 161.5 cm.

Cervicals 1–3, 7, and part of 4 are original, as are part or all of dorsals 3, 8–10, 12, 14, and 17–18, and lumbars 1–5. Except for the last three pseudo-sacrals or fused caudals, the sacrals and caudals are restored. Parts of 12 ribs of the left side and of two of the right are original. Both scapulæ and fore limbs are almost completely original except the right humerus. The pelvis and the left femur are restored. The right femur and tibia and all metatarsals are in part original and the rest of the hind limbs is fairly complete. The vertebral formula C7, D18, L6 was assigned to the species. The attitude selected is one of repose, with the head slightly elevated above the back, the right fore foot slightly advanced and the left hind foot more distinctly advanced beyond the right. In our horse series, this skeleton will be placed between *Miohippus* and *Pliohippus*, both of which are mounted in somewhat more active poses.

The length, as mounted, is 161.5 cm. (5 ft. 3½ in.), and the greatest height of the back (at the fifth dorsal) 89.5 cm.

**Hesperosiren cratægensis** Simpson

A mount of this species, including some original parts from another individual but in large part a replica based on this specimen, was prepared for the Florida State Geological Survey and is now mounted in Tallahassee, Florida. That and the present mount are the only skeletons of fossil sirenians of the Western Hemisphere yet mounted. The basis of the mount is Amer. Mus. No. 26838, type of the species, collected by G. M. Ponton and me in 1929 in the Hawthorn Formation, early Middle Miocene, at Quincy, Florida. The skeleton has been described and characteristic parts figured elsewhere,[1] but it was impossible to prepare illustrations of the whole skeleton for inclusion in that paper. The mount is in small part composite, as detailed below. The specimen was prepared by Carl Sorensen and Haakon Dehlin and mounted by Charles Lang.

The skull of the mount is a plaster reconstruction, based on the original skull of this individual which is complete but very fragile and badly crushed. The lower jaw is unknown, but has been modeled to fit the skull and to compare with the known relatives of the genus. The scapula, manus, pelvis, and femur have similarly been restored by comparison with other sirenians. The type individual includes the sixth cervical, part or all of dorsals 1–3 and 6–16, the last lumbar, the single sacral, and the second and third caudals, with at least parts of all the

[1]Simpson, G. G. 1932. 'Fossil Sirenia of Florida and the Evolution of the Sirenia.' Bull. Amer. Mus. Nat. Hist., LIX, pp. 419–503. [See pp. 427–443, Figs. 1–10.]

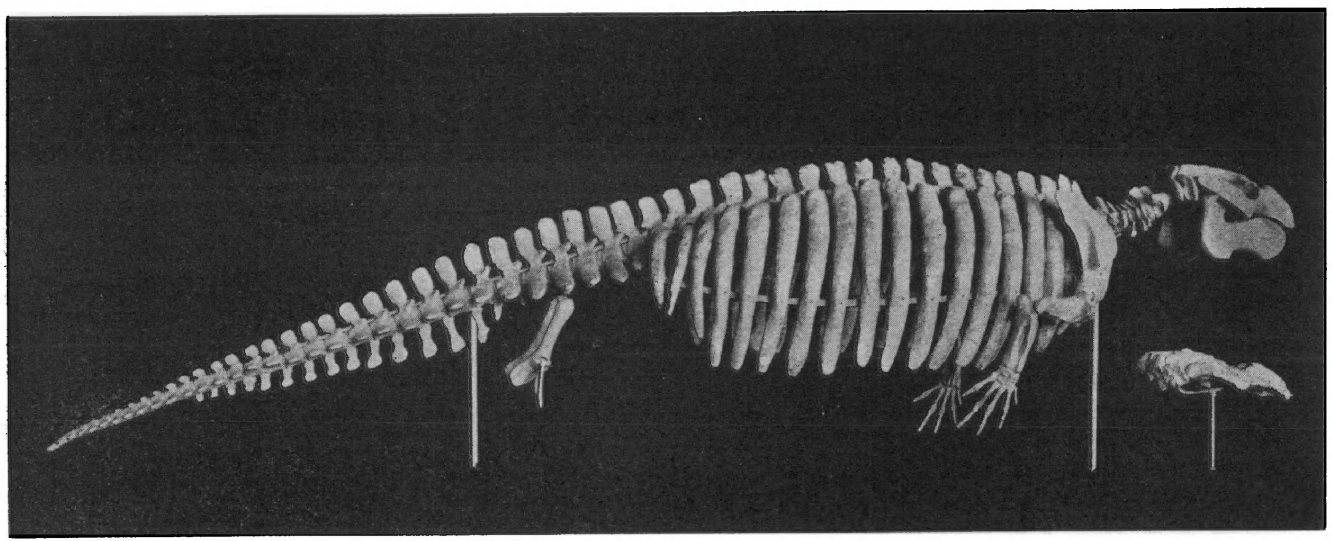

Fig. 3. *Hesperosiren cratægensis* Simpson. Amer. Mus. No. 26838, with slight additions from Amer. Mus. No. 26840 and Amer. Mus. No. 26839. Mounted skeleton, from the right side.

The skull with the skeleton is a replica with crushing corrected, and the original skull of this individual is mounted separately below. Length of mount (between verticals), 304.5 cm.

ribs of the right side except the fifth and a number of ribs from the left side. The fifth cervical, Amer. Mus. No. 26840, is from a topotype. Right and left humeri, and left radius and ulna are from another topotype (Amer. Mus. No. 26839, presented by the Florida State Geological Survey).

In the restoration of missing parts and the arrangement of the bones, all published data on fossil sirenians, the well known cast of *Halitherium schinzi*, and the recent *Dugong* and *Trichechus* have been carefully compared. The skeleton is a free mount in a nearly horizontal position, the fore part slightly raised above the hind and the back gently arched, somewhat less interesting but permitting closer examination and involving fewer technical difficulties than a more vertical or more active pose.

In comparison with the present mount, the well known restoration of *Halitherium schinzi* by Lepsius,[1] which has been widely copied as illustrative of fossil sirenians, differs in several particulars not dependent on purely morphological distinctions. Although the attitudes of vertebral column and fore limb given by Lepsius are doubtless possible, they are stiff and awkward. The ribs as shown by him are too curved and slender and in part at least are directed too much posteriorly. Most important, however, is the pelvis. The pelvic bone shown by Lepsius on the left side clearly belongs on the right. He shows it horizontal, but it is certain from recent sirenians and from the history and mechanics of the bone that it should be more nearly vertical. The end shown as anterior by Lepsius should be directed slightly backward, and that shown as posterior should be nearly in contact with the transverse process of the sacral vertebra. These shortcomings were previously corrected in the paper restoration by Stromer.[2] The cast of Lepsius' species which has hitherto represented the fossil Sirenia in the American Museum exhibition is a careful mount, correct for the most part, but even in it the two halves of the pelvis were on the wrong sides.

The length of the mount of *Hesperosiren* between verticals is 304.5 cm. (10 ft.), and along the curve 320 cm. (10 ft. 6 in.). The living animal, with its caudal fin, would considerably exceed this length. The greatest width (across the twelfth ribs) is 73 cm.

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[1]Lepsius, G. R. 1881. *Halitherium schinzi*, die fossile Sirene des Mainzer Beckens. Abh. Mittelrhein. Geol. Ver., I. [Pl. VIII.]

[2]Stromer v. Reichenbach, E. 1912. 'Lehrbuch der Paläozoologie.' II Teil: Wirbeltiere. [See Fig. 211.]